Notes on the types of scorpions in the British Museum (Natural History), London *Buthus socotrensis* Pocock, 1889 (Family: Buthidae)

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Résumé

L'étude des syntypes de *Buthus socotrensis* Pocock et de spécimens conservés au British Museum (Natural History) et au Muséum national d'Histoire naturelle de Paris confirme la validité de cette espèce jusqu'alors non retenue par les Spécialistes. *Buthus socotrensis* doit être placé dans le genre *Buthotus* Vachon, 1949, mais les caractères particuliers de sa trichobothriotaxie nécessitent la création d'un nouveau sous-genre: *Balfourianus*, création confirmant l'endémisme de la faune scorpionique de l'île Socotra.

Introduction

Buthus socotrensis was first described by R. I. Pocock in 1889 on the examination of four specimens collected from Socotra Island by Prof. B. Balfour. The description was then completed by Pocock in 1903. His new diagnosis corroborated K. Kraepelin's statement (1899) concerning the classification of the species in the *hottentota*-group of the genus *Buthus*.

In 1914, A. Birula, studying specimens collected by Franz Werner from North Africa, re-examined the species belonging to Kraepelin's *hottentota*-group (which he considered of sub-generic value). As noted by Pocock *Buthus socotrensis* is not referable to the sub-genus but must be placed close to *Buthus acutecarinatus* Simon, 1883 and *B. gibbosus* Brullé, 1832.

Pocock's species *socotrensis* was omitted from our revision of the family Buthidae and its classification was considered to be uncertain (Vachon & Stockmann, 1968).

On the basis of the study of four specimens belonging to the type-series and kept in the British Museum (Nat. Hist.) and of specimens from Socotra Island, deposited either in the Muséum national d'Histoire naturelle Paris (M.N.H.N.) or in the British Museum (B.M.), *socotrensis* could be referred to the genus *Buthotus* Vachon, 1949; nevertheless, a new name becomes necessary for the new sub-genus. *Balfourianus*, named after the first collector of the species: Prof. Baillie Balfour, is thus proposed.

Material examined

Consists of 11 females, three of these belonging to the type-series, Prof. T. B. Balfour, B.M. reg. no. 18, 81–106:

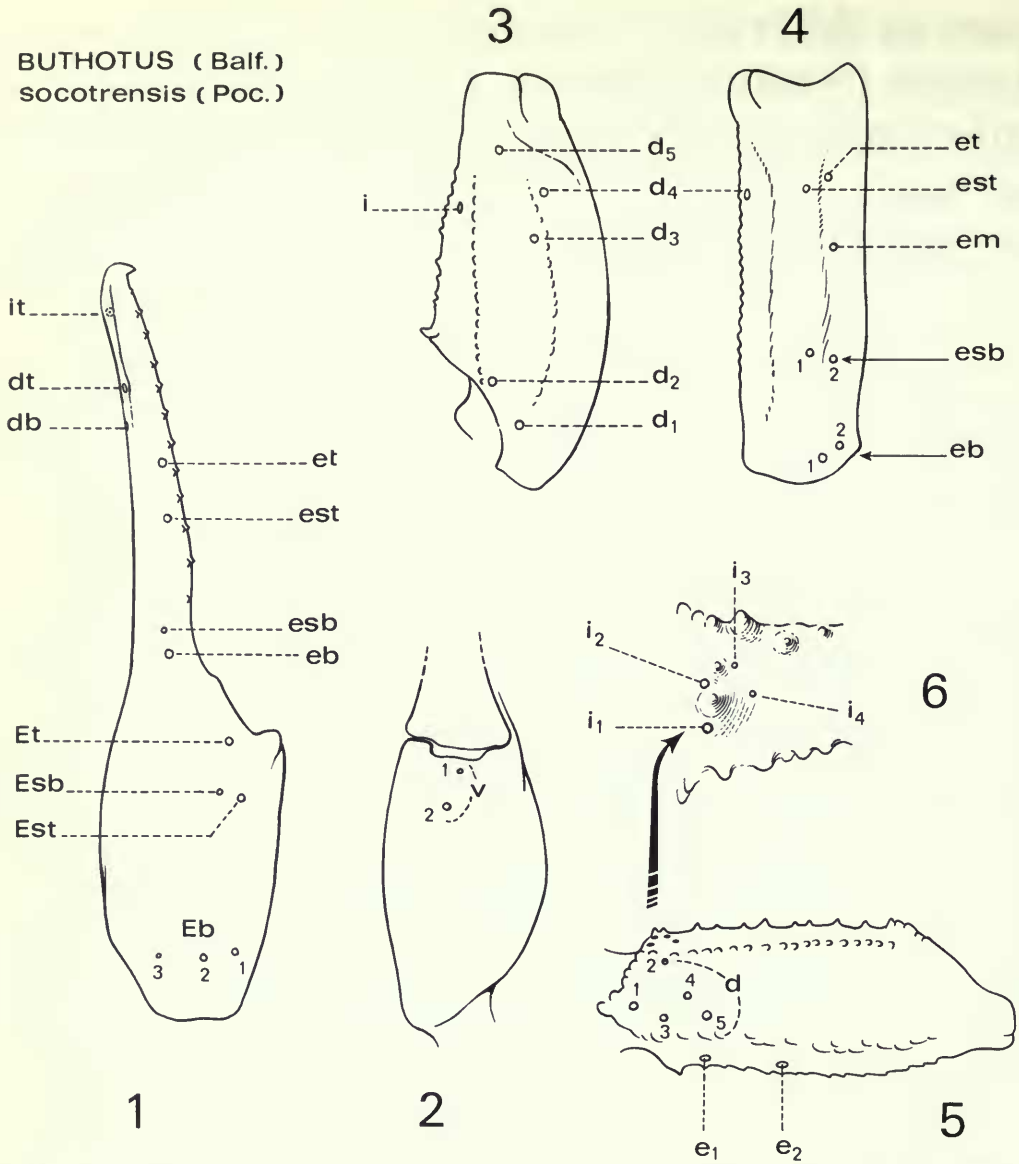
1 female lectotype (B.M.), registered as VA 1621–1. Among the four specimens studied by R. I. Pocock, none has been designated as the type; therefore, the female, the measurements of which correspond to the specimen originally described by R. I. Pocock (*loc. cit.*, 1889 : 339) has been designated as the lectotype.

2 female paralectotypes (B.M.): VA 1621–2 and VA 1621–3.

3 females (B.M.): VA 1218, VA 1220, VA 1222, Oxford University Exp., Hadibu Plain, 22.ix.1956, Socotra Island.

1 female (B.M.): VA 1695, Oxford University Exp., August 1956, Adho Dimellus, only under rock in damp areas, Socotra Island.

Bull. Br. Mus. nat. Hist. (Zool.) **36** (4) : 233–237 Issued 25 October 1979



Figs 1 to 6 Right pedipalp of female paralectotype: VA 1621–2. 1, external side of chela; 2, ventral side of hand; 3, dorsal side of tibia (=forearm); 4, external side of tibia; 5, dorsal side of femur (=arm); basal area of internal side of femur. Only the trichobothries have been figured.

1 female (B.M.): VA 1224, Socotra Island, 10.x.1956; Zool. Soc. Lond. leg.

2 females (M.N.H.N.P.): RS 4684, RS 4687, Socotra Island, Hadibu Plain, K. M. Guichard leg. 1967.

1 female (M.N.H.N.P.): RS 4686, Socotra Island, sea level, K. M. Guichard leg. 1967.

and of 7 males:

1 male paralectotype (B.M.): VA 1621–4, Socotra Island, T. B. Balfour, 81–106.

1 male (B.M.): VA 1219, Zool. Soc. Lond. leg, 10.x.1956, Socotra Island.

3 males (B.M.): VA 1221, VA 1225, VA 1226; Oxford Univ. Exp., 1956; Socotra Island.

1 male (M.N.H.N.P.): RS 4685, Socotra Island, 28.iv.1967, Kalansya under palm fronds; K. M. Guichard leg.

The study of these 17 specimens fully supports the existence of the characters given in Pocock's diagnosis. Some data concerning the trichobothriotaxy, the chaetotaxy, the caudal keels and the pectinal teeth number will supplement the original diagnosis.

Trichobothriotaxy (Figs 1 to 6)

It agrees with our description of the *Buthotus*-genus (*loc. cit.*, 1949 : 145) but differs from it in that the trichobothry *db* is always distal to *et* (Figs 1 to 8) instead of basal (Fig. 7). This '*invariant*' disposition, i.e. unrelated to the sex or to the age of the specimen, is a taxonomic character of primary importance in easily discriminating between the Socotra Island species and the other known *Buthotus* species. On the basis of the relative positioning of the trichobothries *et*, *est*, *dt*, *db*, two sub-genera could be recognized in the genus *Isometrus* H. and E. (Vachon, 1972); in our revision of the genus *Lychas* C. L. Koch, this character has also been used.

Chaetotaxy

Among all the specimens examined, numerous and short setae, together with tergal ones, could be observed on the pedipalps (Polytrichy). The caudal segments only bear few setae, symmetrically arranged (Oligotrichy).

Caudal keels (metasoma)

According to R. I. Pocock (1903), because of the presence of a paired keel on the upper surface of the segment, the fourth segment bears 12 keels (which is unusual). Its existence could be settled. The keel consists of a row of granulae which may also occur (but less regularly) on the dorsal groove of almost all the segments, including the last one. It seems not to be a 'true 'keel.

Number of pectinal teeth

In R. I. Pocock's diagnosis (*loc. cit.*, 1889 : 339) the sex of the specimens examined could not be ascertained; neither was it stated whether the numbers indicated (24–25; 28–29) deal with individual variations or with sexual ones. But, in 1903, the sexual origin of the variations could be stated, the pectines of the female bearing 24 or 25 teeth, whereas in males, they are 28 or 29.

The sex of the 18 specimens at our disposal (11 females and 7 males) could easily be identified.

The following combinations could be noted:

in females: 23–25 (1 time); 25–24 (2 times); 25–25 (4 times); 26–25 (2 times);

in males: 27–28 (1 time); 28–29 (1 time); 29–28 (1 time); 30–31 (1 time); 31–31 (1 time); 31–32 (1 time); 32–30 (1 time).

It may be pointed out that:

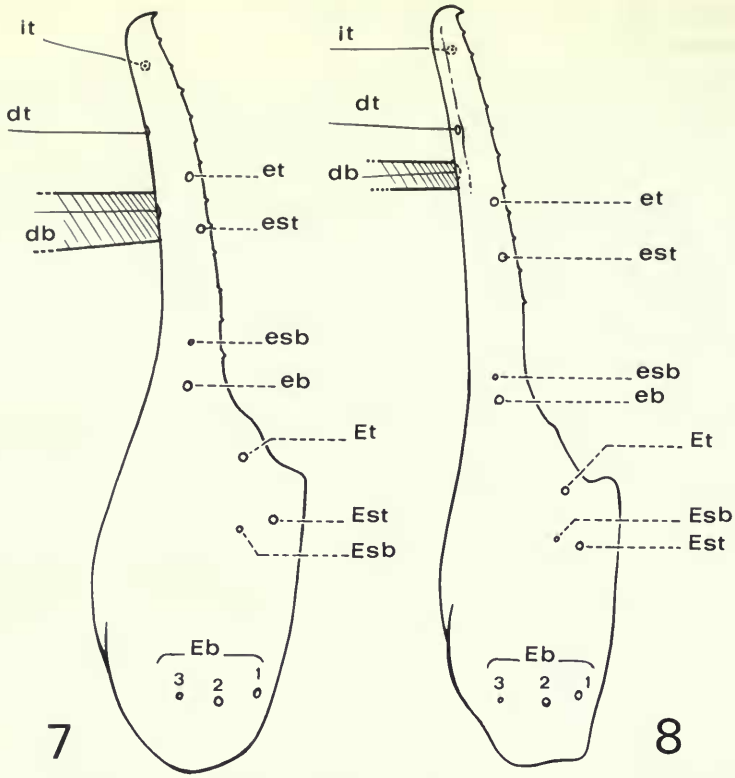
1. The number of pectinal teeth is a character of importance in discriminating between the sexes owing to the fact that in females it varies from 23 to 25, instead of from 27 to 32 in males.

2. The asymmetry is frequent, the number of teeth on the left side of a specimen differing from that found on the right one. Thus, of the 11 pairs of female pectines examined 7 are asymmetrical and in males, 6 of the 7 pairs of pectines are assymmetrical too.

3. The number 25 (referred to as type-number) is more frequently observed in females (15 of the 22 pectines examined); in males, owing to the small number (7) of specimens available, it could not be ascertained, But it may be noted that the arithmetical mean of the teeth number on each pectine is 29 ($\frac{407}{14}$).

Conclusions

1. On the basis of its trichobothriotaxy, *Buthotus socotrensis* may be easily separated from the other known *Buthotus* sp. It permits recognition of two sub-genera in the genus *Buthotus* Vachon, 1949: *Balfourianus* s.g. nov., to which the species *socotrensis* Pocock, 1889 may be referred and the type-subgenus: *Buthotus*, which for the moment includes the other known species.



Figs 7 and 8 Right chela. 7, in *Buthotus* (*Buthotus*) sp.; 8, in *Buthotus* (*Balfourianus*) *socotrensis* (Pocock). The 'territory' on which the position of *db* varies (according to species or to specimens belonging to the same sub-genus) is hachured.

Therefore, the generic diagnosis published in 1949 should be slightly modified according to the remarks published in 1968 (Vachon & Stockmann, *loc. cit.* : 89).

Revised diagnosis of the genus *Buthotus* Vachon, 1949

Concerning the positioning of the trichobothry *db* on the fixed finger, it may be noted that *db* is on the distal half of the finger but its position varies; it may be distal to *et* or between *et* and *est* or slightly basal to *est*.

Diagnosis of the nominal subgenus: *Buthotus* (*Buthotus*)

Characters very similar to those of the sub-genus but the trichobothry *db* is *always basal* to *et*.

Diagnosis of the new subgenus *Buthotus* (*Balfourianus*)

Characters very similar to those of the sub-genus but *db* is *always distal* to *et*.

The two sub-genera may be separated by means of the following key:

Fixed finger with *db* clearly distal to *et* (Figs 1 and 8) so that *dt* and *db* are both distal to *et* . . . . . s.g. nov. *Balfourianus*
Type: *B.* (*B.*) *socotrensis* (Pocock, 1889); Socotra Island.

db between *et* and *est* or slightly basal to *est* (Fig. 7) . . . . . s.g. *Buthotus*
Type: *B.* (*B.*) *judaicus* (Simon, 1872); Africa and Asia.

2. Endemism could be ascertained from the existence of a sub-genus and of a species of *Buthotus* occurring in Socotra Island as might be inferred from the presence of two other species which

have never been collected elsewhere: *Hemiscorpion socotranus* Pocock, 1889 (Fam. Scorpionidae) and *Butheolus insularis* Pocock, 1889 (Fam. Buthidae).*

It may be noted that an endemic genus, *Heteronebo* Pocock, 1889, could be observed in Abd-el-Kuri, a small island between Gardafui Cape and Socotra Island; two species: *H. granti* Pocock, 1889 and *H. forbesii* Pocock, 1889 are assignable to the genus (Fam. Diplocentridae). The genus has never been collected from Somalia, from Socotra or from Arabia (O. F. Francke, 1977).

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*O. F. Francke (1977) points out the presence of three endemic species on Socotra Island: *Hemiscorpion socotranus* Pocock (Scorpionidae), *Butheolus insularis* Pocock (Buthidae) and *Orthochirus socotrensis* Pocock (Buthidae). *Buthotus socotrensis* (Pocock) is not mentioned. On our part, we have no data concerning *Orthochirus socotrensis* (Pocock).

Manuscript accepted for publication 3 May 1978.